

Application Number: 10/016,896
Amendment dated July 23, 2004
Reply to Office action of May 4, 2004

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Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method of forming a self-aligned contact hole suitable for a semiconductor substrate having a pair of gate electrodes, comprising the steps of:

forming a nitride etching stop layer over the gate electrode and the semiconductor substrate;

forming an oxide insulating layer on the nitride etching stop layer; and
plasma-etching the oxide insulating layer by an etching gas consisting of C_2F_5 and CHF_3 , so as to form a self-aligned contact hole between the pair of gate electrodes, wherein the C_2F_5/CHF_3 mixture ratio of the etching gas is between 0.4 and 0.75, thereby equalizing the etching rate to the etching stop layer at the top corner and the bottom of the contact hole.

Claim 2 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 1, wherein the oxide insulating layer is BPSG.

Claim 3 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 1, wherein the oxide insulating layer is silicon oxide formed by a reactive gas containing TEOS.

Claim 4 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 1, wherein the nitride etching stop layer is silicon nitride.

Claim 5 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 1, wherein the nitride etching stop layer is silicon oxy-nitride.

Claim 6 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 1, wherein the etching gas further comprises an inert gas.

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Claim 7 (Previously Presented): The method of forming a self-aligned contact hole as claimed in Claim 6, wherein the inert gas is argon gas.

Claims 8-22 (Canceled)

Claim 23 (Previously Presented): The method of forming a self-aligned contact hole as claimed in claim 1, wherein the pressure of the plasma chamber is kept at 30 to 70 mtorr in the steps of etching the oxide insulating layer.

Claim 24 (Previously Presented): The method of forming a self-aligned contact hole as claimed in claim 1, wherein the oxide insulating layer is formed to have a thickness between 6,000 and 10,000 angstroms.

Claim 25 (Currently Amended): The method of forming a self-aligned contact hole as claimed in claim 1, wherein the nitride etching stop layer in the contact hole is removed after the step of etching the oxide insulating layer by etching to expose the an ion-implanting region.